

FORM PTO-1390  
(REV 5-93)U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICEATTORNEY DOCKET NO.  
106145-00022

DATE: September 7, 2001

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371U.S. APPLN. NO.  
(IF KNOWN, SEE 37 C.F.R. 1.5)  
New

09/926137

INTERNATIONAL APPLICATION NO.  
PCT/JP00/07375INTERNATIONAL FILING DATE  
October 23, 2000PRIORITY DATE CLAIMED  
January 27, 2000

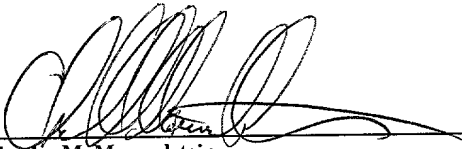
TITLE OF INVENTION: TUBELESS TIRE

APPLICANT(S) FOR DO/EO/US: Satoshi MAKINO

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.  
(THE BASIC FILING FEE IS ATTACHED)
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures [35 U.S.C. 371(f)] at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper demand for International Preliminary Amendment was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed [35 U.S.C. 371(c)(2)]
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English [35 U.S.C. 371(c)(2)].
7. ☒ Amendments to the claims of the International Application under PCT Article 19 [35 U.S.C. 371(c)(3)]
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 [35 U.S.C. 371(c)(3)].
9. ☒ An oath or declaration of the inventor(s) [35 U.S.C. 371(c)(4)].
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 [35 U.S.C. 371(c)(5)].

Items 11 - 16 below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: PCT/ISA/210  
Drawings (☒ Figs. 1-6, 6 sheets)

U.S. APPLIC. NO. (IF KNOWN) SEE 37 C.F.R. 1.50) New <div style="font-size: 2em; font-weight: bold; margin-top: 10px;">097926137</div>	INTERNATIONAL APPLICATION NO. PCT/JP00/07375	ATTORNEY DOCKET NO. 106145-00022  DATE: September 7, 2001					
17. <input checked="" type="checkbox"/> The following fees are submitted: <b>Basic National Fee [37 C.F.R. 1.492(a)(1)-(5)]:</b> Search Report has been prepared by the EPO or JPO.....\$860.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482).....\$690.00 No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO [37 C.F.R. 1.445(a)(2)].....\$710.00 Neither international preliminary examination fee (37 C.F.R. 1.482) or international search fee [37 C.F.R. 1.445(a)(2)] paid to USPTO.....\$1,000.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4).....\$ 100.00		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">CALCULATIONS</th> <th style="width: 40%;">PTO USE ONLY</th> </tr> <tr> <td colspan="2" style="height: 100px;"></td> </tr> </table>		CALCULATIONS	PTO USE ONLY		
CALCULATIONS	PTO USE ONLY						
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>		\$ 860.00					
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date [37 C.F.R. 1.492(e)].		\$					
Claims	Number Filed	Number Extra	Rate				
Total Claims	5 - 20 =	0	X \$ 18.00				
Independent Claims	1 - 3 =	0	X \$ 80.00				
Multiple dependent claim(s) (if applicable)		+ \$270.00	\$ 270.00				
<b>TOTAL OF ABOVE CALCULATIONS =</b>		\$ 1,130.00					
Reduction by one-half for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 C.F.R. 1.9, 1.27, 1.28).		\$					
<b>SUBTOTAL =</b>		\$ 1,130.00					
Processing fee of \$130.00 for furnishing the English translation later the <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date [37 C.F.R. 1.492(f)].		\$					
<b>TOTAL NATIONAL FEE =</b>		\$ 1,130.00					
Fee for recording the enclosed assignment [37 C.F.R. 1.21(h)]. The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property		\$ 40.00					
<b>TOTAL FEES ENCLOSED =</b>		\$ 1,170.00					
		Amount to be refunded	\$				
		Charged	\$				
a. <input checked="" type="checkbox"/> A check in the amount of \$1,170.00 to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 01-2300 in the amount of \$ to cover the above fee. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 01-2300.							
NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive [37 C.F.R. 1.137(a) or (b)] must be filed and granted to restore the application to pending status.							
SEND ALL CORRESPONDENCE TO: Arent Fox Kintner Plotkin & Kahn 1050 Connecticut Avenue, N.W. Suite 400 Washington, D.C. 20036-5339 Tel: (202) 857-6000 Fax: (202) 638-4810 CMM/mzk							
		 Charles M. Marmelstein Reg. No. 25,895					

**PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Satoshi MAKINO

New US National Stage of PCT/JP00/07375

Filed: September 7, 2001

Attorney Dkt. No.: 106145-00022

For: TUBELESS TIRE

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

Date: September 7, 2001

Sir:

Prior to initial examination of the application, please amend the above-identified application as follows:

**IN THE CLAIMS:**

Please amend claims 4 and 5 as follows:

4. (Amended) A tubeless tire according to one of claims 1 or 2, wherein a pneumatic layer is formed between said most inner layer and said inner liner layer, in which there is provided a fixed distance between the same layers at one point at least of said non adhesion part.

5. (Amended) A tubeless tire according to one of claims 1 or 2, wherein openings are formed at regular interval in the non adhesion part of said most inner layer.

## REMARKS

Claims 1-5 are pending in this application. By this Amendment, claims 4 and 5 have been amended to delete improper multiple dependency. No new matter is contained in the amendments.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300.

Respectfully submitted,



Charles M. Marmelstein  
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CMM/mzk

What is claimed is:

1. A tubeless tire comprising twin bead portions, each of which lets a wheel engage it; an outer layer portion having a tread portion to be grounding; and an inner liner layer included rubber, which is entirely stuck inside of the outer layer portion, said tubeless tire comprising:

the most inner layer inside of said inner liner layer, which not only maintains airtight of the tubeless tire, but includes an adhesion part, in which it is stuck to the inner liner layer, and non adhesion part, in which it is not stuck on the inner liner layer and it can be transformed independently for the outer layer portion and the inner liner layer.

2. A tubeless tire according to claim 1, wherein said adhesion part includes an adhesion part, in which said non adhesion part stuck to said inner liner layer is formed in a line or dot.

3. A tubeless tire according to claim 1 or claim 2, wherein said most inner layer has a form of pleat.

4. A tubeless tire according to one of claims 1, 2, 3, wherein a pneumatic layer is formed between said most inner layer and said inner liner layer, in which there is provided a fixed distance between the same layers at one point at least of said non adhesion part.

5. A tubeless tire according to one of claims 1, 2, 3, wherein openings are formed at regular interval in the non adhesion part of said most inner layer.

6/pts

TUBELESS TIREBACKGROUND OF THE INVENTIONField of the invention

The present invention relates to a structure of a tubeless tire, which can prevent the air inside the tire from leaking out, even if suffering from external injuries by harmful material such as a nail or the like during running of a vehicle.

Prior art

Today, as for a tire of vehicle, there is a tubeless tire widely used currently, for which there is not a tube utilized. The tubeless tire keeps airtight of a tire by making a rubber layer inside of the tire, so called an inner-liner layer.

When a foreign matter such as a long nail or the like stuck in this tubeless tire during running of a vehicle and penetrated the inner-liner layer, air in the tubeless tire has leaked through this penetration part, there might have been a event that running of a vehicle has become inability

For such an air leak, it is coped with by that seal materials included a tackiness rubber are put on the inside of the inner liner layer beforehand or that a rubber having viscoelasticity is stuck on the entire surface thereof. For example, when the seal materials are put on the inside of the inner liner layer in advance, the penetration portion will be filled up by self sealing action of seal materials and it can prevent a pneumatic large effluence in a tubeless tire.

However, in order to get the self sealing action of seal materials, it is necessary for seal materials to be put on the inside of the inner liner layer

thick so that a weight of the tubeless tire increases. And due to a load transformation of a tire in running, a temperature of the seal materials itself rises, so that there may be a trouble that the seal materials have fluidity. When the seal materials have fluidity, the seal materials come to change their shape in the tubeless tire by rotational oscillation and a weight balance of the tubeless tire collapses, so that vibration of a vehicle is coming brought out.

The present invention has been made the forgoing problems to be solved. It is the primary object of the present invention to provide a tubeless tire, which can prevent abrupt air leak from the same, even if suffering from external injuries by harmful material such as a nail or the like during running of a vehicle.

#### SUMMARY OF THE INVENTION

As for the present invention, there is a constitution provided, in which a tubeless tire comprising: twin bead portions, each of which lets a wheel engage it; an outer layer portion having a tread portion to be grounding; an inner liner layer included rubber, which is entirely stuck inside of said outer layer portion, wherein there is provided the most inner layer in inside of the inner liner layer, which not only keeps airtight of the tubeless tire, but also includes both an adhesion part, in which it is stuck to the inner liner layer, and non-adhesion part, in which it is not stuck on the inner liner layer and it can be transformed independently for the outer layer portion and the inner liner layer.

By the constructed in this way, as the most inner layer does not slip on the inner liner layer by virtue of the adhesion parts in usual traveling, it is possible to drive smoothly. Besides, even if the nails stick to

the tubeless tire and penetrate the outer layer portion and the inner liner layer, as the stress that the most inner layer receives from the nails is absorbed by transformation of the non-adhesion part of the most inner layer, the nails can be provided from penetrating the most inner layer portion. And it is able to prevent the tubeless tire from leaking the air thereof.

Besides, according to the present invention, there is provided a constitution that the adhesion part includes another adhesion parts, in which the non-adhesion part that is not stuck to the inner liner layer is glued thereto, and formed in shape of lines or of dots, so that a gap of the most inner layer and the inner liner layer can be surely prevented from occurring in running of the tubeless tire, and when nails stick therein, the most inner layer is surely transformed.

Furthermore, there is a constitution provided, in which the most inner layer has a pleat. Accordingly, it can be transformed bigger, so that even if big stress is added to the most inner layer from the outside, it can be absorbed thereby.

Moreover, there is a constitute provided, in which there is an air or a pneumatic layer formed between the most inner layer and the inner liner layer, in which there is provided a fixed distance between the same layers at one point at least of the non adhesion part. In addition, in case of adopting a constitution that there are formed openings at regular interval in the non-adhesion part of the most inner layer, a difference of air pressures of chambers that are located front or rear of the most inner layer is effectively reduced.



## BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a cross sectional view of a tubeless tire of this invention.

Fig.2 is a cross sectional view showing the state that a nail has stuck in a tubeless tire of this invention.

Fig.3 (a) and (b) is respectively one part of enlarged view showing the adhesion part of the most inner layer.

Fig.4 (a) is a cross sectional view of the tubeless tire which made a pleat or a fold for the most inner layer.

Fig.4 (b) is one part of enlarged view of folds.

Fig.5 is a cross sectional view of a tubeless tire having a pneumatic layer between the most inner layer and the inner liner layer.

Fig.6 (a) is one part of enlarged view which shows the most inner layer that openings are formed.

Fig.6 (b) is the cross sectional view showing the state that a nail has stuck in the tubeless tire used the most inner layer shown in Fig. 6 (a).

## DESCRIPTION OF THE PREFERRED EMBODIMENT

### [First Embodiment]

This invention will be described in further detail with reference to the accompanying drawings. Fig.1 is one part of a cross sectional view of a tubeless tire according to the present invention.

The tubeless tire 1 comprises: an outer layer portion 2; and an inner liner layer 3 including rubber or the like, which is stuck on the whole inside of the outer layer portion 2. Furthermore, there is a most inner liner layer 4 provided in an inside of the inner liner layer 3.

The outer layer portion 2 comprises: a bead portion 5, which lets a wheel (as shown with broken line) engage it; a tread portion 6 to be

grounding; and a sidewall portion 7, which is a region between the bead portion 5 and the tread portion 6. More further, there is provided a carcass 8 made from fibrous materials in each inside of the bead portion 5, the sidewall portion 7 and the tread portion 6 in order to maintain a form of the tubeless tire. Besides, there are a plurality of belts 9 inserted between the tread portion 6 and the carcass 8 in order to fix a stiffness of the tread portion 6. Still more, there is each of components of the outer layer portion 2 formed in one united body with glued all together by glue or vulcanization mold treatment.

The inner liner layer 3 is made from rubber, which has a role to prevent the tubeless tire 1 from leaking air injected inside thereof out and is stuck on the whole inside of the outer layer portion 2.

The most inner layer 4 is made from rubber and the like, and in each of parts 4a, 4a (as shown in Fig. 1), there is an adhesion part provided, through which the most inner layer 4 is glued on the inner liner layer 3 (as made in a body) by glue or vulcanization mold treatment. At this point, (in Fig. 1), there is non-adhesion part spread in region except for the adhesion part 4a. Therefore, the non-adhesion part of the most inner layer 4 can be transformed independently for the inner liner layer 3 and the outer layer 2.

The most inner layer 4 has a thickness of 0.3mm ~ 5mm prepared, and it is made from butyl type rubber, butyl type rubber combined with latex type rubber, styrene-butadiene rubber or natural rubber. In addition, as for a span or a width of the adhesion 4a of the tubeless tire 1, it is desirable for it to be around 10mm ~ 50mm from a bead portion 5.

Besides, in order to increase an anti-air permeability of the most inner layer 4, the resin having a elasticity such as Velaren (a registered

trademark of The Yokohama Rubber Co., Ltd.) or the like may be mixed said the inner layer 4 with, or also the fiber such as polyester, polyamide, aramid and the like may be mixed with.

Still more, it is possible that the rubber layer may be laminated with a reinforcement layer made from a combination of said resin and/or said fiber. In addition, as for the direction where the fiber or the fiber layer is displayed, any of direction such as radial direction, lap direction or cross direction will do, and there may be a plurality of fiber layers provided, which are laminated one after another.

Subsequently, as for the condition when a foreign matter such as a nail or the like sticks in a tread portion 6 of the tubeless tire 1 and penetrates both the outer layer portion 2 and the inner liner layer 3 thereof, it will be described referring to Fig. 2.

As shown Fig. 2, a nail 10 penetrates both the outer layer portion 2 and the inner liner layer 3 but the nail 10 does not penetrate non-adhesion part 4b of the most inner layer 4, because the non-adhesion part 4b of the most inner layer 4 is transformed not only independently for the outer layer portion 2 and the inner liner layer 3, but also for the stress received from the nail 10 to seem to be absorbed. Therefore, inside air of the tubeless tire 1 does not leak out.

As for the most inner layer 4, it may be glued to the inner liner layer 3 except for the adhesion part 4a as shown in Fig. 1. For example, as shown in Fig. 3 (a) and (b), there may be respectively liner adhesion parts 11 and dot like adhesion part 12 provided, at which it is glued to the inner liner layer 3. Consequently, as for such an adhesion part 11 or 12, either dot like or liner adhesion thereof does not prevent the most inner layer 4 from

transforming and prevent the same from slipping out of predetermined position of the inner liner layer 3 as well.

Besides, a region except for the adhesion parts 11 and 12, which is shown in Fig. 3 (a) and (b), is all non-adhesion part.

Further, as for each line or each point of those adhesion parts 11 or 12, it is desirable for the interval thereof to be 10mm ~ 150mm because in case that the interval is smaller than 10mm, the most inner layer 4 cannot be transformed fully enough to absorb stress to be received from the nail, and in case that the interval is bigger than 150mm, the non-adhesion part thereof is hardly strange to that of the case that the adhesion parts are only 4a, i.e. there is no adhesion part therein.

Furthermore, to show in Fig. 4 (a) and (b), there can be formed a plurality of folds 15 in the most inner layer 14. In addition to the expansion of the most inner layer 14 itself, by the transform of the folds 15, it becomes possible for bigger stress to be absorbed.

Moreover, in Fig. 4 (a) and (b), as for a part except the folds 15 of the most inner layer 14, it is possible for it to be glued to the inner liner layer 3 through the adhesion part 4a (shown in Fig.1), the liner adhesion part 11 (shown in Fig. 3 (a)) or the dot or point like adhesion part 12 (shown in Fig. 3 (b)).

Besides, there may be the folds 15 formed, each wave of which is formed or established at equal spaces as shown in Fig.4 (b) and it may be established in succession not to open an interval. And as for height of the fold 15, it is desirable for it to be 5mm ~ 50mm. When it is lower than 5mm, effect of transformation of a fold is not provided, and when it is higher than 50mm, it causes the tubeless tire 1 to vibrate or oscillate and leads to

vibration of a vehicle.

Furthermore, as for a direction of the folds 15, according to the present invention, it is established in the perpendicular direction to rotatory direction of the tubeless tire 1 as shown in Fig. 4 (a), but it can be arranged in arbitrary direction, i.e., parallel or the like to the rotatory direction.

And, in Fig. 4 (a), the fold 15 is made for inside of the most inner layer 14; however, it may be established in outside of the most inner layer 14. In this case, it is desirable that there is a part provided, at which a pointed head of the fold 15 is contacted to the inner liner layer 3, and in which, the fold 15 and the inner liner layer 3 are glued together through the liner adhesion part 11 or the dot like adhesion part 12 formed there.

#### [Second Embodiment]

Another embodiment according to the present invention will be described referring to drawings. It should be noted that the reference numeral is used on the same element as in the first embodiment, and the same explanation will be omitted.

As shown in Fig. 5, there is the most inner layer 4 of the tubeless tire 1 provided, which non-adhesion part 4c thereof is left only a being fixed distance from the inner liner layer 3 and there is a pneumatic layer 16 between formed. Hereupon, the pneumatic layer 16 has a role to prevent a tensile stress from concentrating on the same part of non-adhesion part 4c to be transformed by nails stuck in the tubeless tire as the non-adhesion part 4b shown in Fig. 2.

As for the non-adhesion part 4b shown in Fig. 2, by difference in pressure between an inside of the tubeless tire 1 and a space formed between the inner liner layer 3 and the non-adhesion part 4b of the most

inner layer 4, there is the stress loaded with, which is going to make the space small. Particularly, the tensile stress has concentrated on the point part of the non-adhesion part 4b transformed by the nail 10.

Accordingly, if there is a pneumatic layer 16 as shown in Fig. 5 provided, an inner pressure of which is substantially equal to the inner pressure of the tubeless tire, it is easy to come to prevent a nail from penetrating in the most inner layer 4 more because a stress that is loaded the most inner layer 4c with can be reduced.

Such pneumatic layer 16 is formed as follows.

First, the non-adhesion part 4c of the most inner layer 4 corresponding to the tread portion 6 is let be separated only fixed distance from the inner liner layer 3.

Subsequently, there is glued the adhesion part 4a on the inner liner layer 3 by vulcanization mold treatment, while air is introduced into the space that appears by the separating.

Further, the most inner layer 4 could hold a change by a heat of the most inner layer 4 in check, when aramid fiber to have a little transformation by a heat is glued thereto. Because the most inner layer 4 glued aramid fiber on has scarcely any transformation by a heat, in comparison that the outer layer portion 2 and inner liner layer 3 are transformed as expanding out by a heat at the time of vulcanization mold treatment, there can be the pneumatic layer 16 provided at the time of vulcanization mold treatment. At this point, it is preferable for aramid fiber to be glued in outside of the most inner layer 4 but it may be glued in inside thereof.

Moreover, there may be formed a plurality of project portions in

the pneumatic layer 16 side of the most inner layer 4, which are stuck on the inner liner layer 3, so that the gap with the most inner layer 4 and the inner liner layer 3 can be prevented from occurring.

[Third embodiment]

Another embodiment according to the present invention will be described referring to drawings. The same reference numeral is used on the same element as in the first embodiment, and the same explanation will be omitted.

As shown in Fig. 6 (a) and (b), as for the tubeless tire of this embodiment, there are formed a plurality of openings 25 stood in line at regular interval in the most inner layer 24 thereof.

When a nail 10 is stuck in the tubeless tire 1, a non-adhesion part 24b of a most inner layer 24 is transformed, and there is a space 26 produced, since air in tubeless tire 1 flows in the space 26 through the opening 25, difference in pressure between the space 26 and an inside of the tubeless tire 1 becomes smaller, so that tensile stress loaded the non-adhesion part 24b with can be reduced. Accordingly, the nail 10 can be prevented from penetrating the most inner layer 24.

Hereupon, as for the openings 25, it is desirable for a diameter of a hole thereof to be around 1mm ~ 2mm and for each distance of regular interval thereof to be 10mm ~ 50mm in order to prevent the nails that stick in the tubeless tire and penetrate the inner liner layer 3 from meeting with the position where the hole of the openings 25 is formed.

In addition, it may be possible that a part of the most inner layer 24 where the openings 25 are not formed is glued on the inner liner layer 3 with the liner or the dot like adhesion to show in Fig. 3. Moreover, he fold

(as shown in Fig.4) can be provided on the most inner layer 24.

This invention is not limited to each of embodiments and can be changed and applied in many ways.

For example, it is established so that the most inner layer 14 to have the fold 15 may form the pneumatic layer and it is possible that above each form is combined each other and adopted.

And the most inner layer 4, 14, 24 are shown to cover the all inside of the inner liner layer 3, but may be formed only to cover a part corresponded to the tread portion 6.

#### Availability of application of industrial field

According to the present invention, there is the most inner layer formed in inside of the inner liner layer provided, which maintains the airtight of the tubeless tire and is constructed that in the non-adhesion part thereof, it is possible to transform its shape independently for the outer layer portion and the inner liner layer, so that the stress loaded the most inner layer with by the nails can be absorbed in the non-adhesion part of the most inner layer. Therefore, the nails can be prevented from penetrating the most inner layer, and air in the tubeless tire can be prevented from leaking out.

Further, as to the gap of the most inner layer and the inner liner layer, it can be prevented from occurring in running of the tubeless tire, owing to the adhesion part provided, in which the most inner layer is stuck on the inner liner layer. Accordingly, unnecessary vibration dose not occur with the tubeless tire.

Furthermore, even if the big stress is added to the most inner layer, it can be absorbed in a fold established in the most inner layer.





What is claimed is:

1. A tubeless tire comprising twin bead portions, each of which lets a wheel engage it; an outer layer portion having a tread portion to be grounding; and an inner liner layer included rubber, which is entirely stuck inside of the outer layer portion, said tubeless tire comprising:

the most inner layer inside of said inner liner layer, which not only maintains airtight of the tubeless tire, but includes an adhesion part, in which it is stuck to the inner liner layer, and non adhesion part, in which it is not stuck on the inner liner layer and it can be transformed independently for the outer layer portion and the inner liner layer.

2. A tubeless tire according to claim 1, wherein said adhesion part includes an adhesion part, in which said non adhesion part stuck to said inner liner layer is formed in a line or dot.

3. A tubeless tire according to claim 1 or claim 2, wherein said most inner layer has a form of pleat.

4. A tubeless tire according to one of claims 1, 2, 3, wherein a pneumatic layer is formed between said most inner layer and said inner liner layer, in which there is provided a fixed distance between the same layers at one point at least of said non adhesion part.

5. A tubeless tire according to one of claims 1, 2, 3, wherein openings are formed at regular interval in the non adhesion part of said most inner layer.

FIG. 1

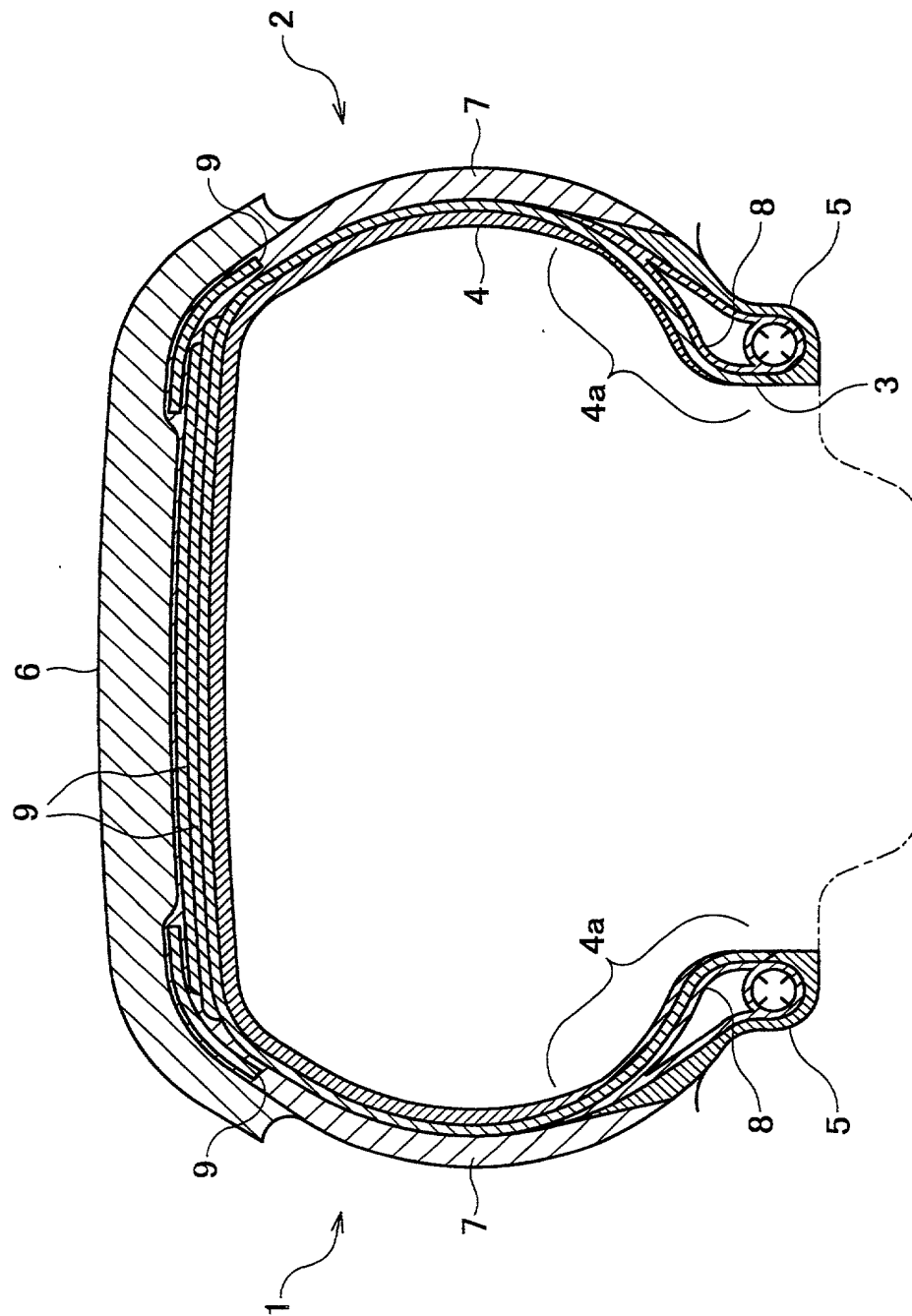


FIG.2

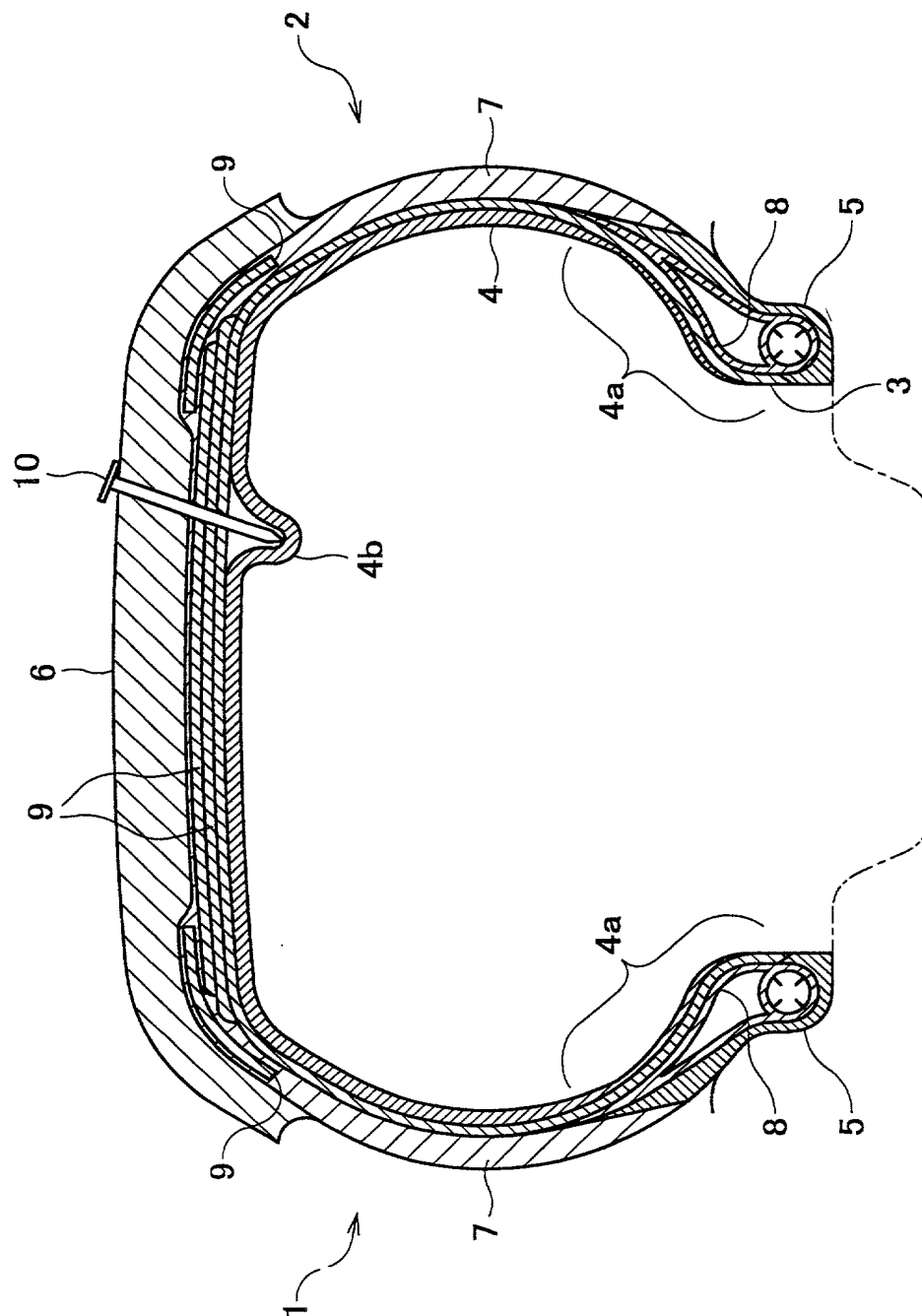
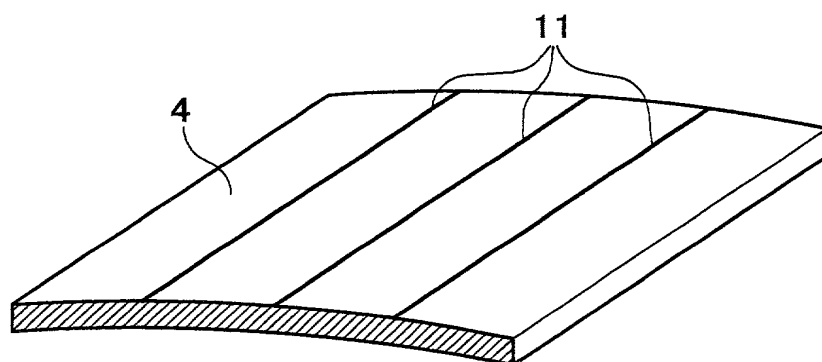


FIG.3

(a)



(b)

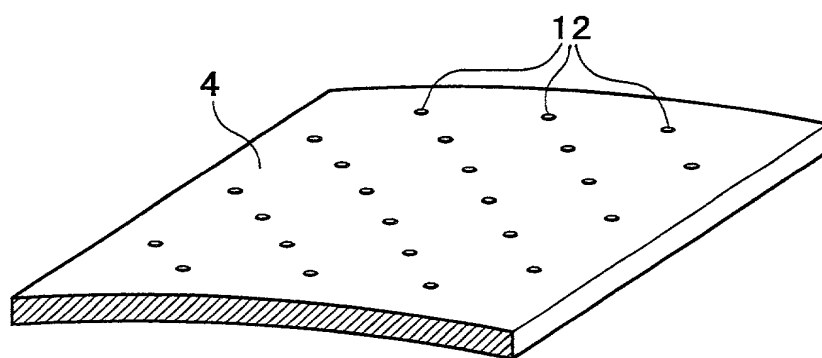


FIG.4

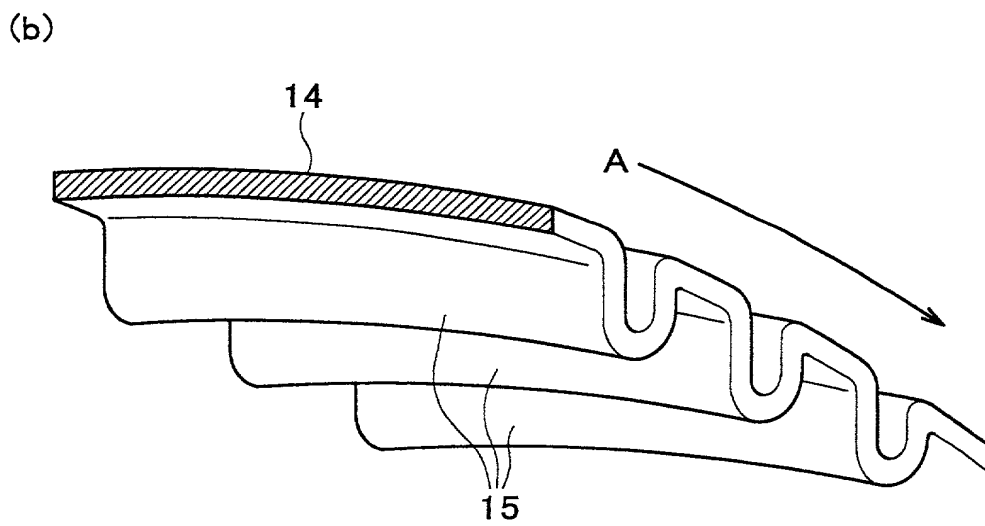
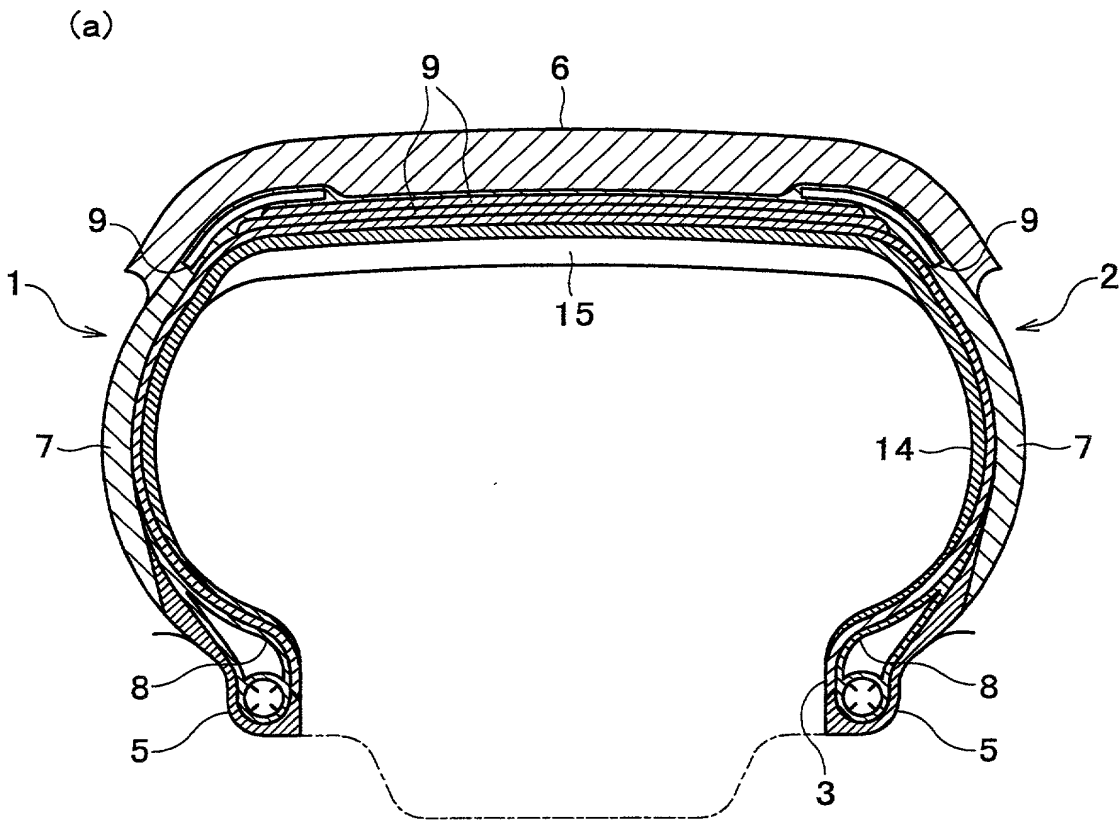


FIG.5

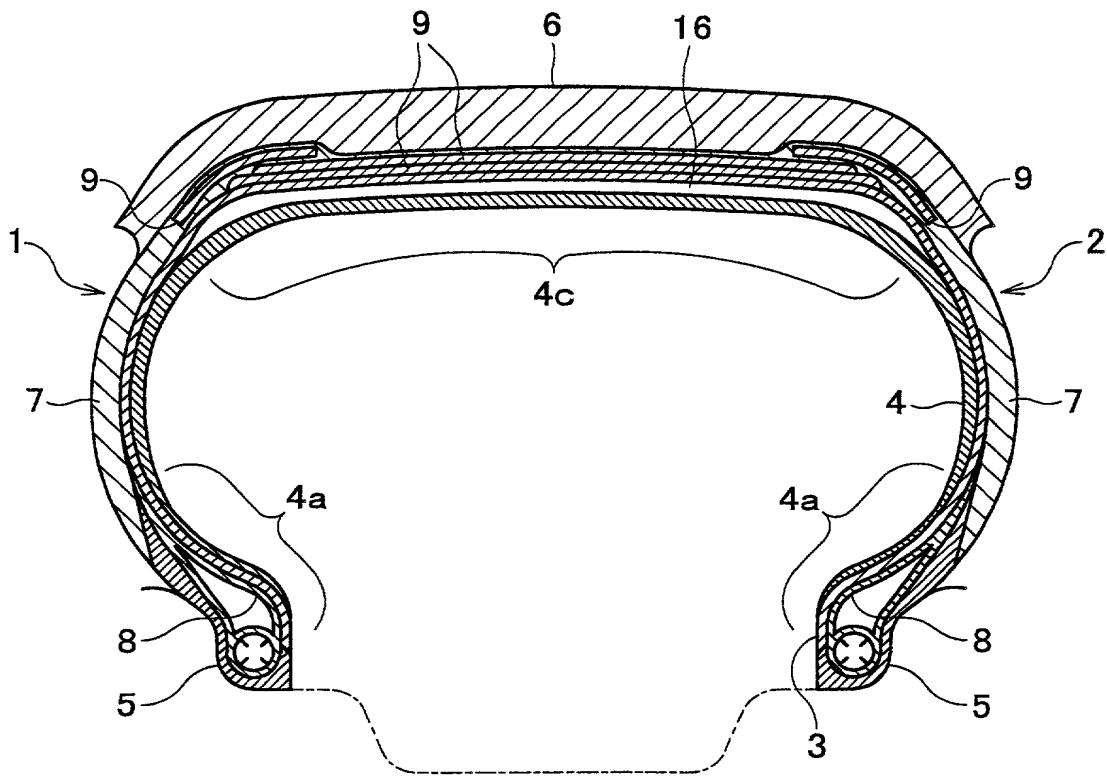
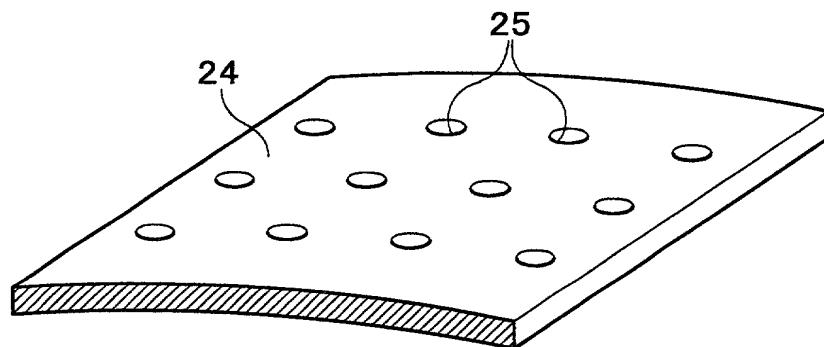
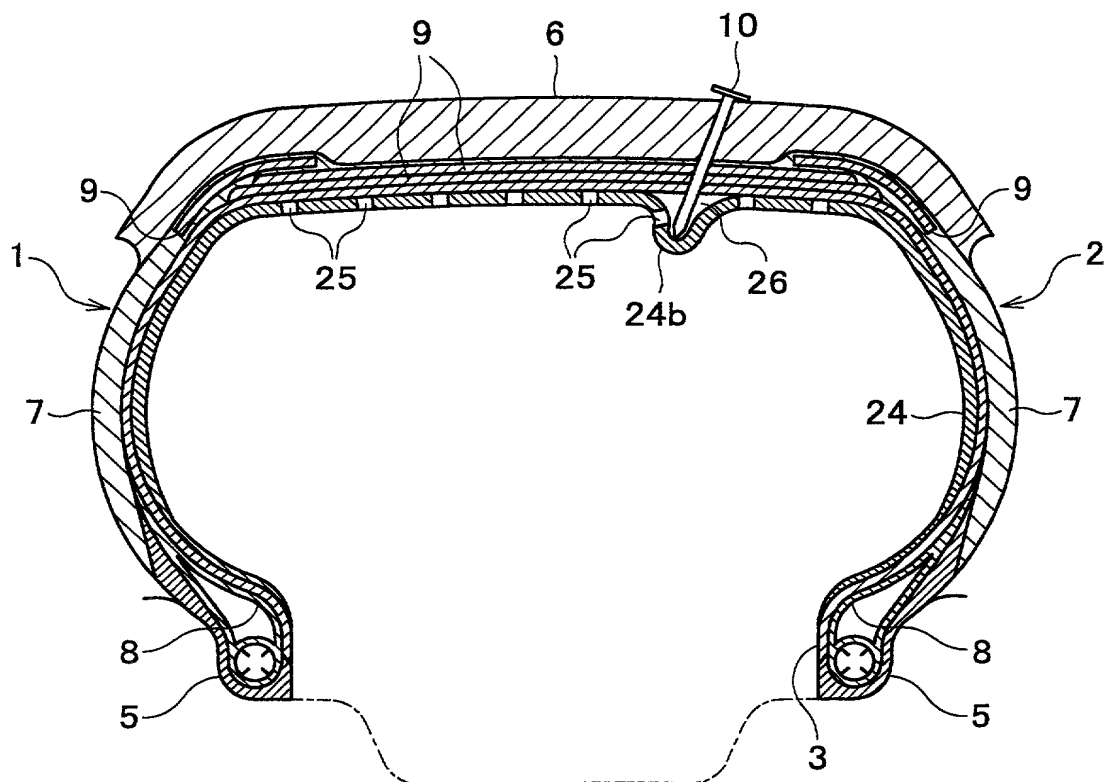


FIG. 6

(a)



(b)





Docket No. \_\_\_\_\_

ARENT FOX KINTNER PLOTKIN &amp; KAHN, PLLC

Nikaido, Marmelstein, Murray &amp; Oram Intellectual Property Group

## Declaration For U.S. Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention **entitled**

(Insert Title) TUBELESS TIRE the specification of which is attached hereto unless the following box is checked:

was filed on 23 October 2000 as PCT International Application

Number PCT/JP00/07375 and was amended on \_\_\_\_\_

and/or was filed on \_\_\_\_\_ as United States Application

Number \_\_\_\_\_ and was amended on \_\_\_\_\_.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate or PCT International Application having a filing date before that of the application(s) for which priority is claimed:

(List prior foreign applications. See note A on back of this page)	<u>2000-018572</u> (Number)	<u>Japan</u> (Country)	<u>27 January 2000</u> (Day/Month/Year Filed)	Priority Claimed	
				× Yes	No
	_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	Yes	No
	_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

\_\_\_\_\_  
(Application Number)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Application Number)

\_\_\_\_\_  
(Filing Date)

(See Note on back of this page)

See attached list for additional prior foreign or provisional applications.

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s) or §365(c) of any PCT International application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior application(s) (U.S. or PCT) in the manner provided by the first paragraph of 35, U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(List prior U.S. Applications or PCT International applications designating the U.S.)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status) (patented, pending, abandoned)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status) (patented, pending, abandoned)

16 And I hereby appoint as principal attorneys: David T. Nikaido, Reg. No. 22,663; Charles M. Marmelstein, Reg. No. 25,895; George E. Oram, Jr., Reg. No. 27,931; Robert B. Murray, Reg. No. 22,980; E. Marcie Emas, Reg. No. 32,131; Douglas H. Goldhush, Reg. No. 33,125; Monica Chin Kitts, Reg. No. 36,105; Richard J. Berman, Reg. No. 39,107; King L. Wong, Reg. No. 37,500; James A. Poulos, III, Reg. No. 31,714; Patrick D. Muir, Reg. No. 37,403; Sharon N. Klesner, Reg. No. 36,335; Murat Ozgu, Reg. No. 44,275; Bradley D. Goldizen, Reg. No. 43,637; N. Alexander Nolte, Reg. No. 45,689; and Robert K. Carpenter, Reg. No. 34,794.

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Inventor's signature

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Inventor's signature

Residence

Date \_\_\_\_\_

## Citizenship

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Full name of seventh joint inventor, if any

**Inventor's signature**

Date \_\_\_\_\_

**Residence**

## Citizenship

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